

# Healthy Indoor Air



# Surprise!

## Scientific evidence shows that...



- Air *within* homes and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialized cities.
- Additional research shows that people spend approximately **90%** of their time indoors.

# Why is Indoor Air Quality important?

- Higher concentrations of pollutants exist indoors
- The lung is typically the most affected organ



# Indoor vs. Outdoor Air

- For many people, the risks to health from exposure to *indoor* air pollution may be greater than exposure to outdoor air pollution.
- Additionally, people who may be exposed to indoor pollutants for longer periods of time are often the most susceptible to the adverse effects.
  - the young
  - the elderly
  - the chronically ill





# Children: Why they are more vulnerable

- Pound for pound children eat, drink, and breath more than adults, increasing dosage of contaminants
- Behavior increases exposure to environmental toxins
- Not fully developed, therefore more vulnerable to the toxins that surround them
- Have more years of life left than adults, more time to develop chronic diseases
- Play at ground level, therefore receive greater inhalation and dermal exposure to chemicals present on the floor



# Findings



- Asthma rates in children have tripled since the 1980s
- Children cancer rates have increased 10% over the last 20 years
- Some 900,000 children under 6 are estimated to have lead levels exceeding standard set by the Center for Disease Control
- Environmental tobacco smoke is responsible for an estimated 150,000 to 300,000 lower respiratory tract infections annually in children under 18 months of age

# Environmental Threats to People's Health Found Inside the Home

- Lead
- Insect Pests
- Pesticides
- Tobacco Smoke
- Pets: Dander, Hair, Saliva, and Feces
- Inadequate Ventilation
- Unvented Clothes Dryers
- Volatile Organic Compounds (VOCs); Formaldehyde
- Personal Care Products
- Hazardous Building Materials
- Asbestos
- Moisture: Fungi, Mold, and Mildew
- Dust and Particulates
- Allergens
- Rodents
- Radon
- Carbon Monoxide and other Combustions



## Clues to Poor Indoor Air

- Are there unusual and noticeable odors?
- Is the humidity level unusually high or is moisture noticeable on the windows or other surfaces?
- Are there signs of mold?
- Does the air seem stale?
- Is there a noticeable lack of air movement?
- When walking into the house do you have symptoms such as itchy or watery eyes, runny nose or throat dryness?
- Is dust on furniture noticeable?
- Are walls, ceilings, furniture or draperies stained or coated with dust?



# Asbestos: White Fibrous Material

## ■ Sources

- Insulation around pipes, duct wrap, and flues
- Roof and siding shingles
- Floor tiles
- Soundproofing materials
- Textured ceilings
- Floor tiles



# Asbestos

## ■ Detection

- Special testing needed
- Contact local Health Department

## ■ Health Effects

- Respiratory problems
- Lung Diseases
- Asbestosis: cancer of the lungs

## ■ Solutions

- If in good condition, LEAVE ALONE!
- Have laboratory test done to confirm or deny presence
- If materials are damaged: need to be sealed and enclosed

# Biologicals: Bugs, Pollen, Animal Hair, Dander, Saliva, and Feces

- Sources

- Animal hair, dander, saliva and feces
- Dust mites, cockroaches, insect residues
- Pollen



# Biologicals

## ■ Detection

- Smelled or seen
- Evidence of rodents and insects
- House pets

## ■ Health Effects

- Allergic reactions
- Asthma attacks
- Some infectious diseases

## ■ Solutions

- Regular cleaning
- Wash bedding with hot water
- Limit use of carpeting, upholstered furnishings and “dust catchers”

# Carbon Monoxide (CO)



## ■ Sources

- Gas ranges
- Fuel-fired space heaters
- Wood burning stoves
- Fireplaces
- Charcoal grills
- Gasoline engines
- Tobacco smoke
- Candles



# Carbon Monoxide (CO)

## ■ Detection

- Install carbon monoxide alarm
- If health symptoms occur only in your home and improve when you leave

## ■ Health Effects

- Fatigue
- Nausea
- Headaches
- Dizziness
- Sleepiness
- Irritated eyes
- Breathing and respiratory problems
- Flu-like symptoms
- Death

## ■ Solutions

- Keep all equipment well maintained and inspected for safety
- Exhaust all pollutants to outside of home
- Maintain adequate pressure balance between home and outside
- Do not allow tobacco smoke inside

# Dust and Particulates

## ■ Sources

- Particles from fireplaces, wood stoves, kerosene heaters
- Dust
- Pollen
- Tobacco smoke



# Dust and Particulates

## ■ Detection

- A large amount of dust in the house and on furniture and floors

## ■ Health Effects

- Eye, nose and throat irritation
- Respiratory infections and bronchitis

## ■ Solutions

- Change filters on heating and cooling systems
- Clean regularly
- Replace carpeting with hard surfaces

# VOC's and Formaldehyde



## ■ Sources

- Particleboard
- Some furniture and floor finishes
- Hardwood, plywood and paneling
- Permanent-press fabrics
- Cosmetics
- Glues

# VOC's and Formaldehyde

## ■ Detection

- Smell
- Environmental testing firms
- Do-it-yourself kits available by mail

## ■ Health Effects

- Irritation of eyes, nose, throat and skin
- Nausea
- Breathing difficulties
- Headaches
- Fatigue
- Asthma attacks

## ■ Solutions

- Identify sources
- Coat surfaces
- Control humidity and temperature
- Ventilate



# Lead

## ■ Sources

- Lead-based paint (1978)
- Residue from leaded gasoline
- Folk medicines
- Dirt containing lead



# Lead

- Detection

- Tests available at hardware store
- Blood test

- Health Effects

- Slow mental development, learning and behavioral problems
- Damage to nervous and reproductive systems
- High blood pressure
- If pregnant, harm to fetus

- Solutions

- Replace painted item
- Cover lead-based paint and do not sand
- Use damp mop to control dust
- Hand wash
- Take shoes off before entering home

# Moisture: Fungi, Mold, and Mildew

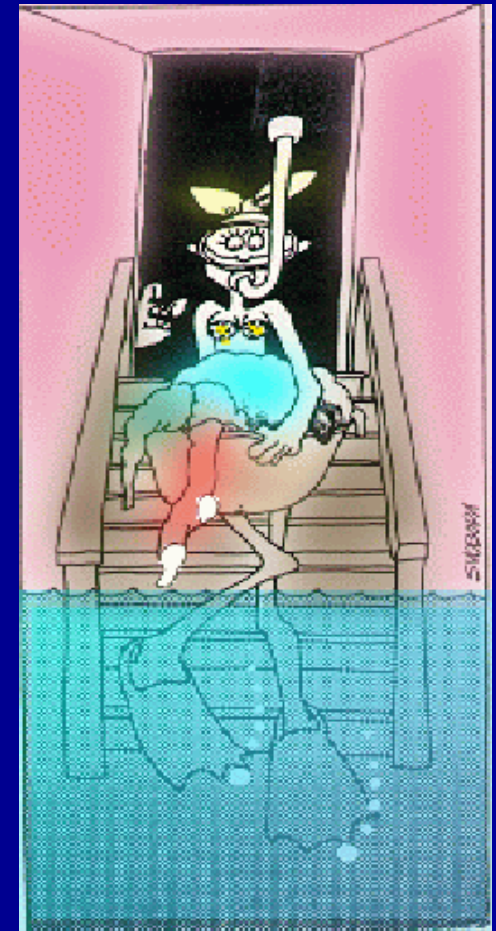


## ■ Sources

- High humidity levels, above 50%
- Poorly maintained air conditioners
- Inadequate ventilation
- Cooking
- Showering

# Moisture

- Detection
  - Musty smell
  - Standing water
  - Evidence of high humidity
  - Mold growing on walls, tiles and window frames
- Health Effects
  - Allergic reactions
  - Asthma attacks
- Solutions
  - Lower humidity levels (keep below 50%)
  - Eliminate water leaks or standing water
  - Clean refrigerator drip trays, humidifiers and air condensing units with disinfectants (chlorine bleach) then rinse
  - Use exhaust fans in the kitchen and bathrooms that vent moisture outdoors



# Black Mold (*Strachybotrys atra*)



- Sources
  - Easily transported by people, animals, & shoes
  - Damp/Moist areas
- Detection
  - Shiny when wet
  - Smears easily and feels slimy
- Health Effects
  - Respiratory bleeding in babies
  - Asthma
  - Bronchitis
- Solutions
  - Disinfect with bleach (1c. bleach to 1 gal. water) Allow it to saturate for 15 minutes and then completely dry the area
  - Use a respiratory mask and eye protection
  - Lab tested



# Tobacco Smoke

- Sources
  - Cigarette, pipe and cigar smoking



# Tobacco Smoke

## ■ Detection

- Tobacco smoke in the home

## ■ Health Effects

- Eye, nose and throat irritation
- Headaches
- Lung cancer
- May contribute to heart disease

## ■ Solutions

- Do not allow people to smoke in your house, especially if children are present

# Radon (Uranium, Radium)



- Sources
  - Soil
  - Well water
  - Some building materials
- Detection
  - Test with radon test kits that say “meet EPA requirements”
- Health Effects
  - Damaged lung tissue
  - Lung cancer
- Solutions
  - Contact certified radon contractor
  - Plug concrete leaks
  - Change ventilation patterns of home

# Other Environmental Threats Found Inside the Home

## ■ Remodeling Activities

- Solutions: Know what is in your home and know what you are remodeling

## ■ Work and Hobby Hazards

- Solutions: Keep workplace separated from other areas of the home; take shoes off at the door; wash contaminated clothes separately

## ■ Household Products

- Solutions: Buy non-toxic products; follow directions on product labels for proper use, storage and disposal; provide adequate ventilation

## ■ Pesticides

- Solutions: Buy organically grown foods; do not use pesticides in the home; wash fruits and vegetables before eating; wash clothes with pesticides on them separately